

Interactive comment on “Selective deposition response to aeolian-fluvial sediment supply in the desert braided channel of the Upper Yellow River, China” by H. Wang and X. Jia

Anonymous Referee #2

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nhess-2014-353 Submitted on 23 Dec 2014 Selective deposition response to aeolian-fluvial sediment supply in the desert braided channel of the Upper Yellow River, China
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Abstract: The results of this paper are really not new! Due to the fluvial dynamic one will find coarser sediment in the channel and finer grain sizes on the flood plain everywhere. The main reason is the higher transport capacity which was not taken into account in the paper. Why? In many parts of the paper the authors talk about the fluvial and aeolian sediment supply but they never measure the amount of supply! The database for the results therefore is missing.

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Introduction Is it true that the relatively fine sediments in the Yellow River lead to an equal mobility of all sediments? The coarser particles should run more slowly. What is the consequence for channel development? Are there no differences between floods and low discharge situations? What are the flow velocities? Perhaps you can compare with the Hjulstrøm diagram (1935)?! You postulate that aeolian sands are coarser than fluvial sediments. There is no grain size analysis in the paper to substantiate this thesis. What is the grain size of fluvial sediments upstream the dunes?

Study area The difference of the sediment load between the two gauges is very poor (1.6 %). How reliable are the measurements of the sediment transport? Is this a significant value of difference? Is there no variation? What is the standard deviation? What is the reason for the decrease of bankfull (with the “n”!) discharge? Are there changes in hydrology? What means this for the development of the channel, the floodplain and the grain size distribution? Are there changes in flood frequency and extreme events?

Methods Is the meaning of “size distribution” grain size distribution? How is the lateral development of the channel connected with changing grain sizes? The paper describes boreholes of 3 m in depth but there is no information how old these deeper layers are! It is to taken into account that the flow condition may have changed!? You compare two gauging stations to get more information about the runoff differences but the downstream station is more than 100 km away from the study area! What happens in between?

Results Fig. 2 is not mentioned in the text. The main channel shows coarser sediments...this is very often described all over the world! The grain size (in the channel and on the flood plain) depends on the flow conditions which are not known in the paper. How do you explain the genesis of coarse grain fractions superimposed by a fine sediment layer? Fig. 4 and 5 should be better readable and fig. 6 seems to be not necessary. I do not follow the thesis of a selective transport of different grain sizes! There are no cross profiles outside the dune area so it is not possible to compare and separate aeolian and fluvial influences! Additional informations about different

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flow characteristics are necessary. What is the reason for growing up the thalweg? More sediment or different flow characteristic (which? evidence?)? "High-rate flow discharges" (frequency or high magnitude?) should induce more channel erosion? But you have the opposite! What is the reason that the peak discharge and the sediment peak distinguish in time (fig. 9)? Where are the main sediment sources?

Discussions and conclusions There is no evidence for the supply of aeolian sediment. What is the grain size and what is the input into the channel? The data are not sufficient to discuss the thesis of helical secondary flow development in this channel. Theoretical approaches from the literature without data from the study site are not useful. Therefore it is no evidence to test these assumptions! Also the discussion of changes in the longitudinal profile is not helpful because there are no measurements (!) and also no records of changing stream patterns At the end the result is more speculative than documented!

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